641.01 General

The roadway on a curve may need to be widened to make the operating conditions comparable to those on tangents. There are two main reasons to do this. One is the offtracking of vehicles, such as trucks and buses. The other is the increased difficulty drivers have in keeping their vehicles in the center of the lane.

See the following chapters for additional information:

Chapter	Subject
430	roadway widths and cross slopes for modified design level
440	minimum lane and shoulder widths for full design level
642	superelevation
940	lane and shoulder widths for ramps

641.02 References

Standard Plans for Road, Bridge, and Municipal Construction (Standard Plans), M 21-01, WSDOT

Standard Specifications for Road, Bridge, and Municipal Construction (Standard Specifications), M 41-10,WSDOT.

A Policy on Geometric Design of Highways and Streets (Green Book), 2001, AASHTO

641.03 Definitions

divided multilane A roadway with 2 or more through lanes in each direction and a median that physically or legally prohibits left-turns, except at designated locations.

lane A strip of roadway used for a single line of vehicles.

lane width The lateral design width for a single lane, striped as shown in the Standard Plans and the Standard Specifications.

roadway The portion of a highway, including shoulders, for vehicular use.

shoulder The portion of the roadway contiguous with the traveled way, primarily for accommodation of stopped vehicles, emergency use, lateral support of the traveled way, and use by pedestrians.

shoulder width The lateral width of the shoulder, measured from the outside edge of the outside lane to the edge of the roadway.

traveled way The portion of the roadway intended for the movement of vehicles, exclusive of shoulders and lanes for parking, turning, and storage for turning.

turning roadway A curve on an open highway, a ramp, or the connecting portion of roadway between two intersecting legs of an intersection.

undivided multilane A roadway with 2 or more through lanes in each direction on which left-turns are not controlled.

641.04 Turning Roadway Widths

(1) Two-lane two-way roadways.

Figure 641-1a shows the traveled way width W for two-lane two-way roadways. For values of R between those given, interpolate W and round up to the next foot.

Minimum traveled way width W based on the delta angle of the curve, shown in Figure 641-1b, may be used. Document the reasons for using the minimum width. Round W to the nearest foot.

Widths given in Figures 641-1a and 1b are for facilities with 12 ft lanes, when 11 ft lanes are called for, width W may be reduced by 2 ft.

(2) Two-lane one-way roadways.

Figure 641-2a shows the traveled way width W for two-lane one-way turning roadways, including two lane ramps and four-lane highways. For values of R between those given, interpolate W and round up to the next foot. Treat each direction of travel of four-lane facilities as a one-way roadway.

Minimum traveled way width W based on the delta angle of the curve, shown in Figure 641-2b, may be used. Document the reasons for using the minimum width. Round W to the nearest foot.

Widths given in Figures 641-2a and 2b are for facilities with 12 ft lanes, when 11 ft lanes are called for, width W may be reduced by 2 ft.

To keep widths to a minimum, traveled way widths for Figures 641-2a and 2b were calculated using the WB-40 design vehicle. When volumes are high for both trucks larger than the WB-40 and other traffic, consider using the widths from Figures 641-1a and 1b.

(3) One-lane roadways.

Figure 641-3a shows the traveled way width W for one-lane turning roadways, including one-lane ramps. For values of R between those given, interpolate W and round up to the next foot.

Minimum width W based on the delta angle of the curve for one-lane roadways, shown in Figure 641-3b using the radius to the outer edge of the traveled way and Figure 641-3c using the radius on the inner edge of the traveled way, may be used. Document the reasons for using the minimum width. Round W to the nearest foot.

Build shoulder pavements at full depth for one-lane roadways because, to keep widths to a minimum, traveled way widths were calculated using the WB-40 design vehicle which may force larger vehicles to encroach on the shoulders.

(4) Other roadways.

- For roadways with more than two lanes in any direction, for each lane in addition to two, add the lane width for the highway functional class from Chapter 440 to the width from 641.04(2).
- For three-lane ramps with HOV lanes, see Chapter 1050.

(5) Total roadway width.

Full design shoulder widths for the highway functional class or ramp are added to the traveled way width to determine the total roadway width.

Small amounts of widening will add cost with little benefit. When the required traveled way widening is less than 0.5 ft per lane, it may be disregarded. If the total roadway width deficiency is less than 2 ft on existing roadways that are to remain in place, correction is not normally required.

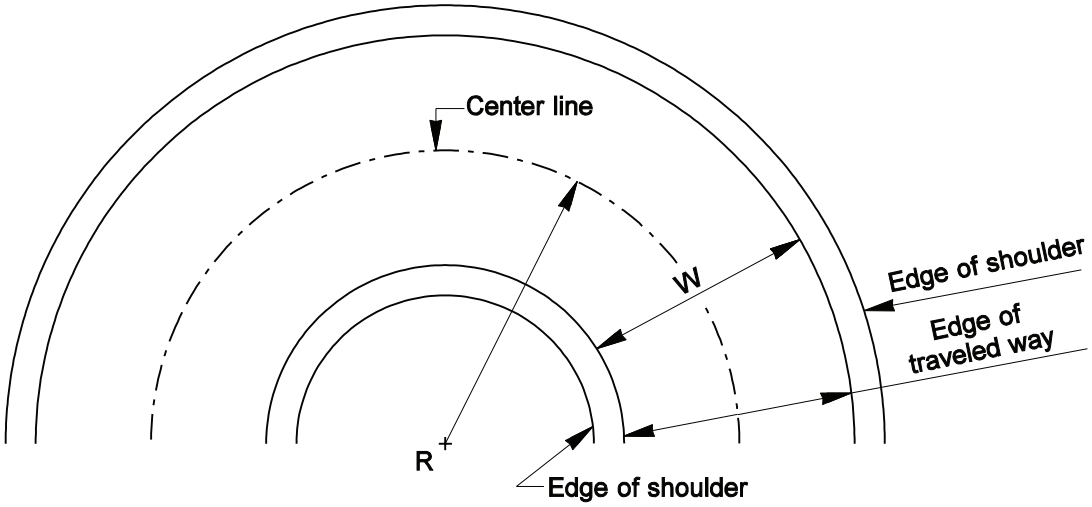
When widening the traveled way:

- Widening may be constructed on the inside of the traveled way or divided equally between the inside and outside. Do not construct widening only on the outside of a curve.
- Place final marked lane lines, and any longitudinal joints, at equal spacing between the edges of the widened traveled way.
- Provide widening throughout the curve length.
- For widening on the inside, make transitions on a tangent, where possible.
- For widening on the outside, develop the widening by extending the tangent. This avoids the appearance of a reverse curve that a taper would create.
- For widening of 6 ft or less, use a 1:25 taper, for widths greater than 6 ft use a 1:15 taper.

641.05 Documentation

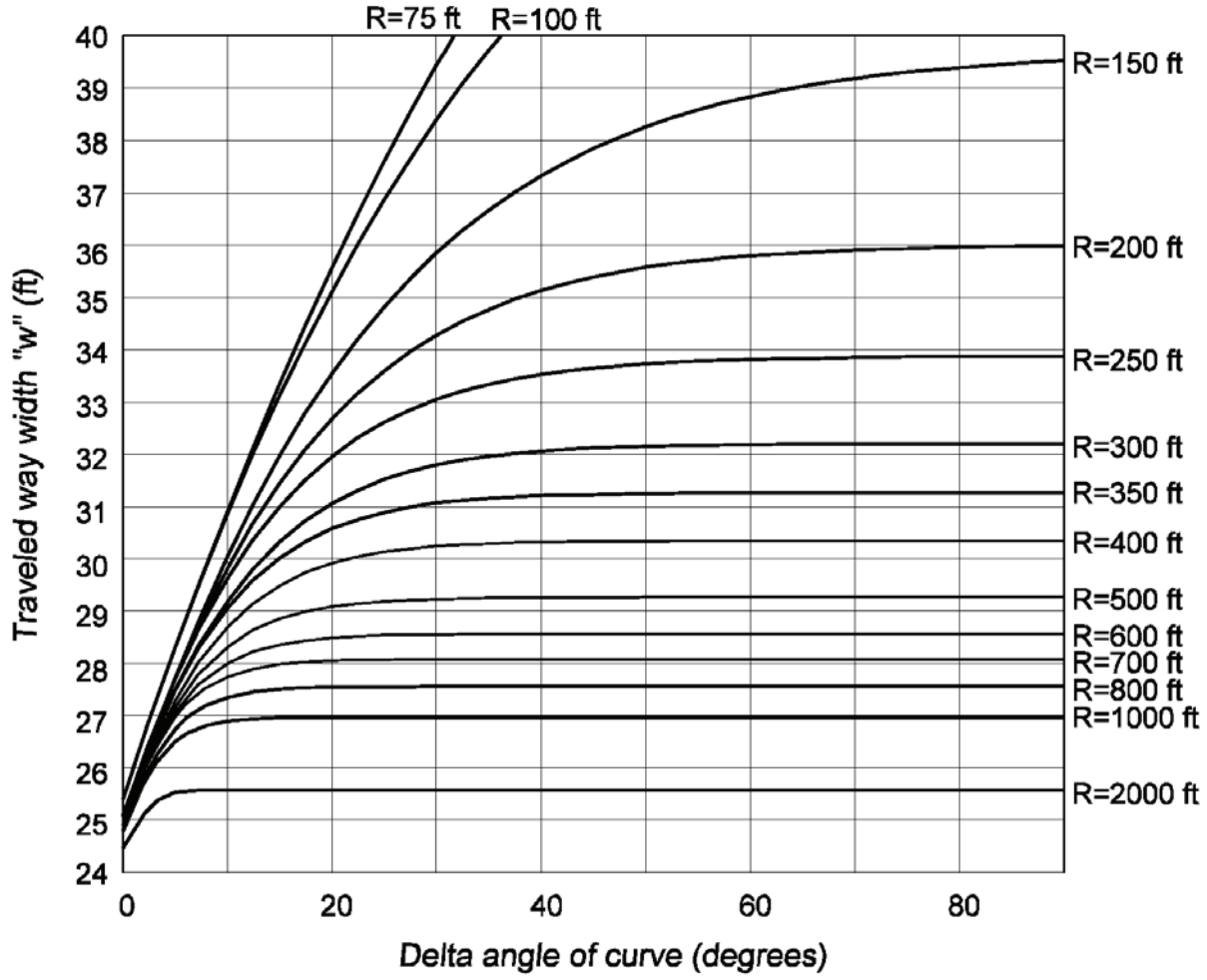
A list of the documents that are to be preserved [in the Design Documentation Package (DDP) or the Project File (PF)] is on the following web site: http://www.wsdot.wa.gov/eesc/design/projectdev/

Radius on center line of traveled way (ft)	Design traveled way width (W) (ft)(1)
3,000 to tangent	24
2,999	25
2,000	26
1,000	27
800	28
700	28
600	29
500	29
400	30
350	31
300	32
250	34
200	36
150	40



(1) Width (W) is for facilities with 12 ft lanes, when 11 ft lanes are called for, width may be reduced by 2 ft.

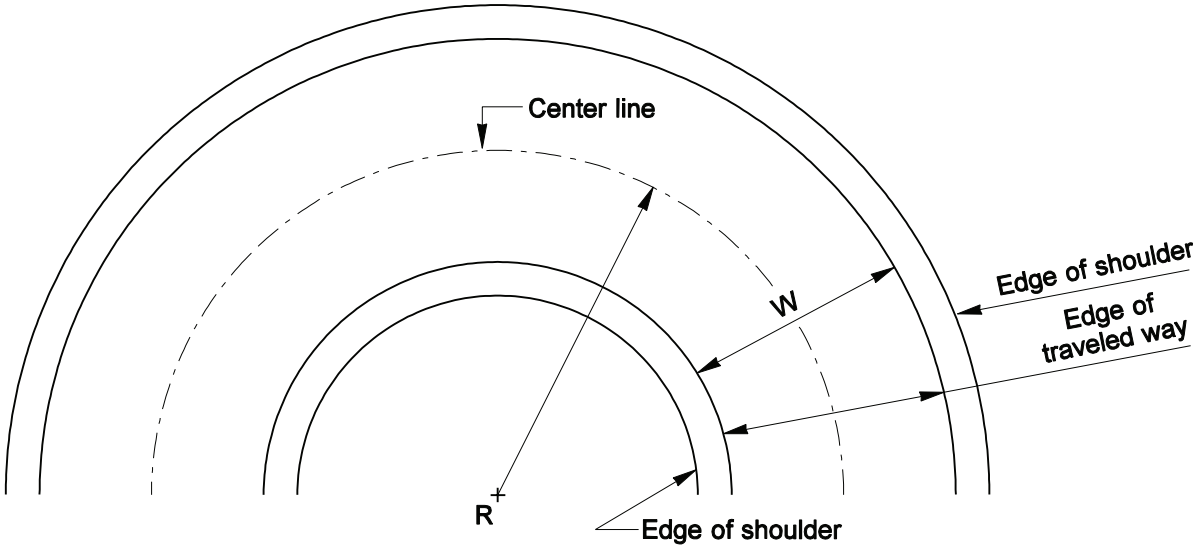
Traveled Way Width for Two-Lane Two-Way Turning Roadways
Figure 641-1a



(2) Width (W) is for facilities with 12 ft lanes, when 11 ft lanes are called for, width may be reduced by 2 ft.

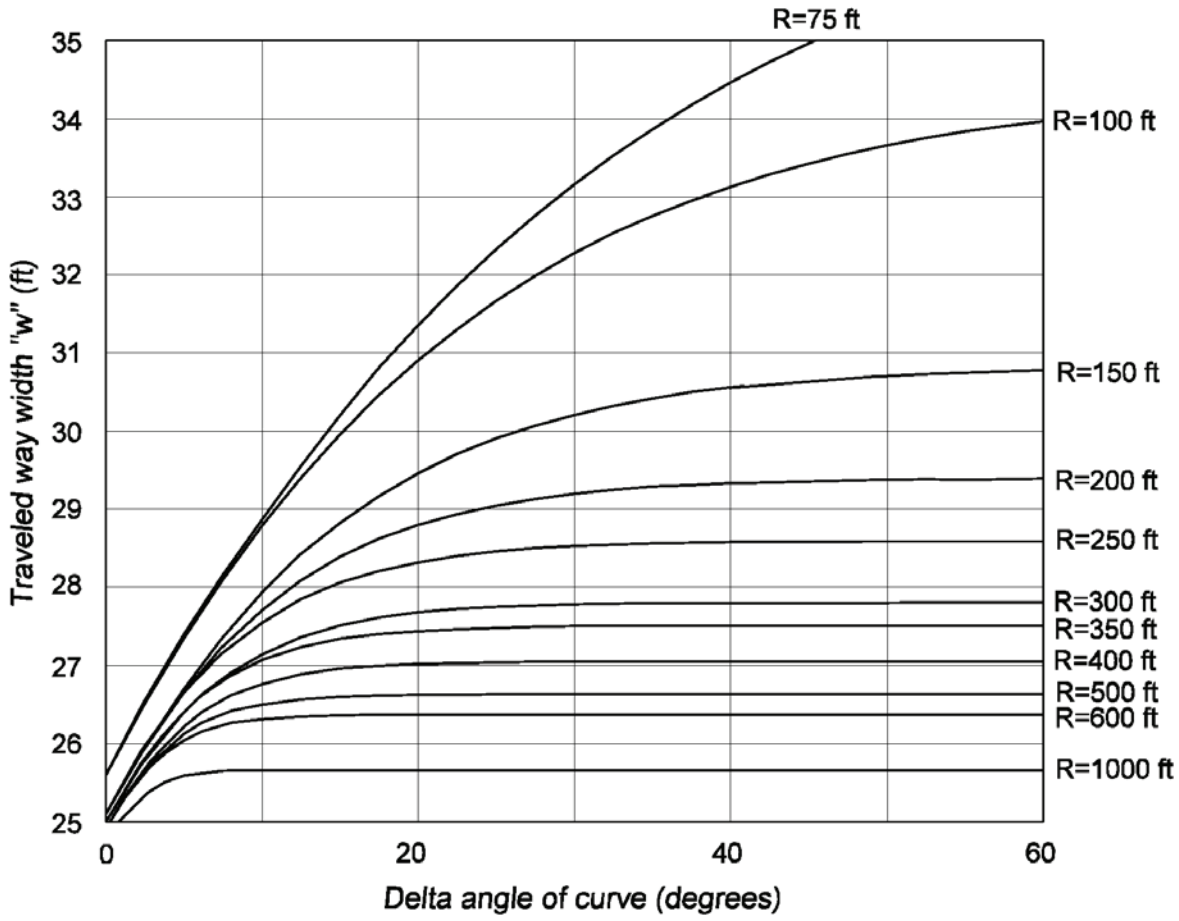
Traveled Way Width for Two-Lane Two-Way Turning Roadways
Figure 641-1b

Radius on center line of traveled way (ft)	Design traveled way width (W) (ft)(1)
3,000 to tangent	24
1,000 to 2,999	25
999	26
600	26
500	27
400	27
350	28
300	28
250	29
200	29
150	31
100	34



(3) Width (W) is for facilities with 12 ft lanes, when 11 ft lanes are called for, width may be reduced by 2 ft.

Traveled Way Width for Two-Lane One-Way Turning Roadways
Figure 641-2a



(1) Width (W) is for facilities with 12 ft lanes, when 11 ft lanes are called for, width may be reduced by 2 ft.

Traveled Way Width for Two-Lane One-Way Turning Roadways
Figure 641-2b

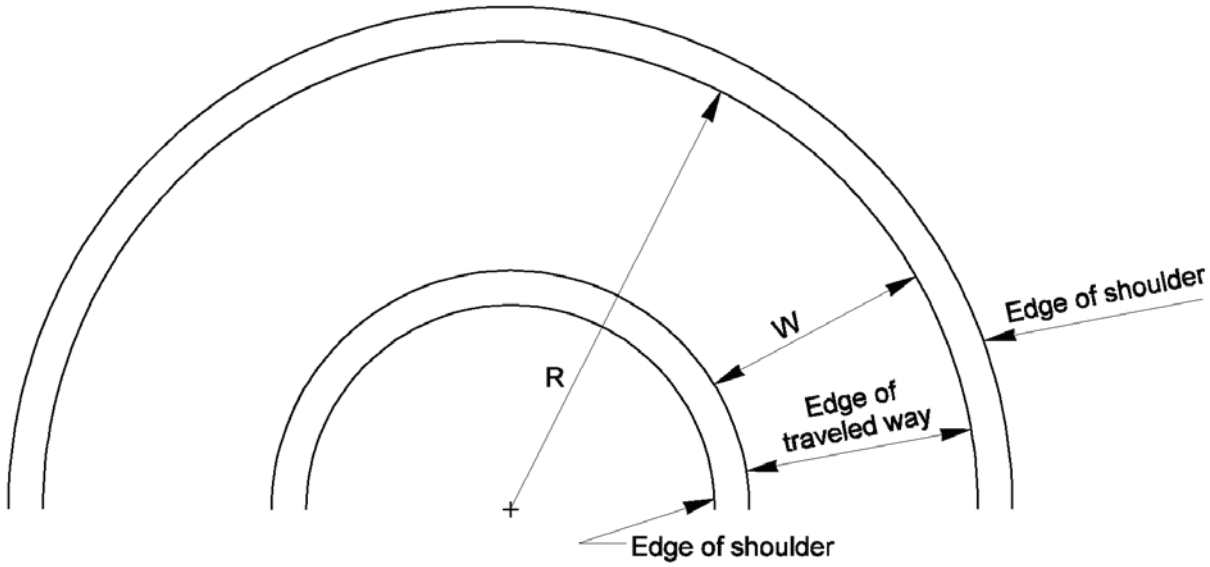
Radius (ft)	Design traveled way width (W) (ft)
7500 to tangent	13 (1)
1600	14
300	15
250	16
200	17
150	17
100	19 (2)
75	21 (3)
50	25 (4)

(1) On tangents, the minimum lane width may be reduced to 12 ft.

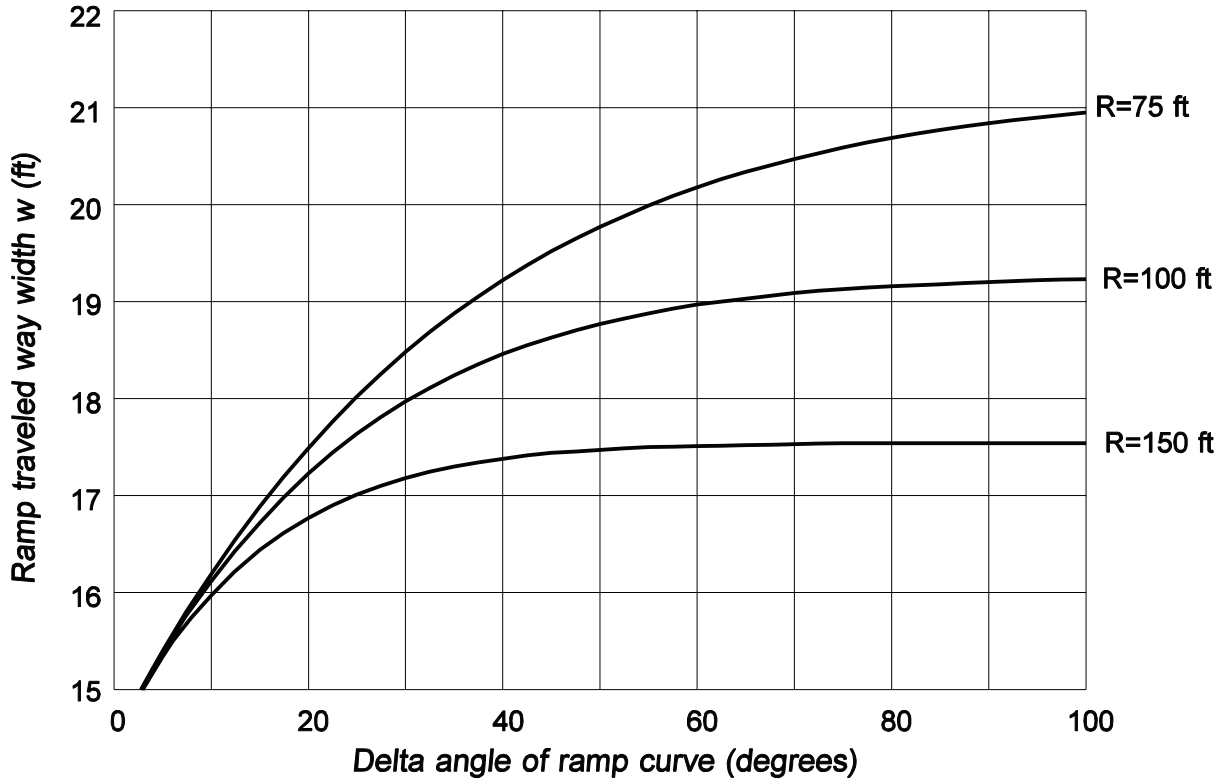
(2) The width given is for a radius on the outside edge of the traveled way. When the radius is on the inside edge of traveled way, the width may be 18 ft.

(3) The width given is for a radius on the outside edge of the traveled way. When the radius is on the inside edge of traveled way, the width may be 19 ft.

(4) The width given is for a radius on the outside edge of the traveled way. When the radius is on the inside edge of traveled way, the width may be 22 ft.

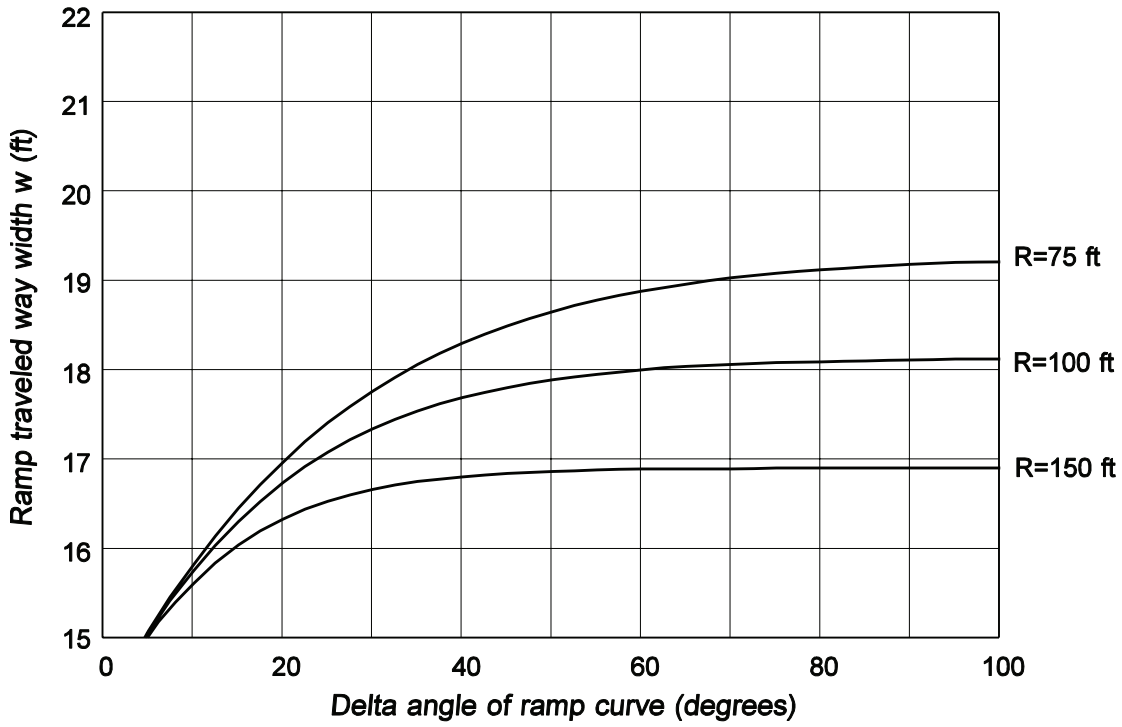


Traveled Way Width for One-Lane Turning Roadways
Figure 641-3a



NOTE: All Radii are to the outside edge of traveled way.

Traveled Way Width for One-Lane Turning Roadways
Figure 641-3b



NOTE: All Radii are to the inside edge of traveled way.

Traveled Way Width for One-Lane Turning Roadways
Figure 641-3c